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09ENG1.5

First Semester B.Arch. Degree Examination, Dec.2015/Jan.2016
Structures – I

Time: 3 hrs.   Max. Marks:100

Note: *Answer any FIVE full questions.*

1 a. Briefly discuss the classification of force system.   (08 Marks)
   b. Find the magnitude direction and position of the resultant stress for the forces in Fig.Q1 (b).   (12 Marks)

Fig. Q1 (b)

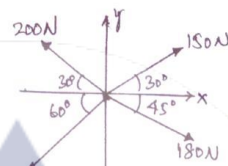2 a. Explain transmissibility of forces.   (04 Marks)
   b. Define resultant and moment.   (04 Marks)
   c. Find the magnitude direction and position of the resultant for the forces shown in Fig. Q2 (c).   (12 Marks)
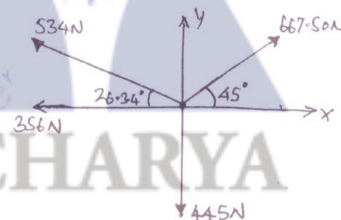
Fig. Q2 (c)

3 a. Explain different types of loads and supports with neat sketches.   (08 Marks)
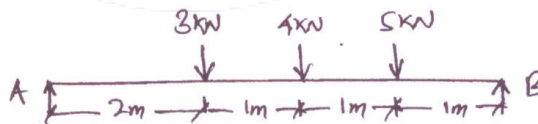   b. Find the support reactions for the beam shown in Fig. Q3 (b).   (12 Marks)

Fig. Q3 (b)

4 a. Enumerate different laws of friction.   (08 Marks)
   b. A uniform ladder of length 10 m and weight 20 N is placed against a smooth wall with its lower end 8 m from the wall. In this position the ladder is just to slip. Determine
      (i) the co-efficient of friction between ladder and floor.
      (ii) frictional force acting on the ladder at the point of contact between ladder and floor.   (12 Marks)
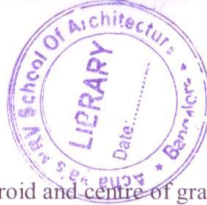
5   a.   Distinguish between centroid and centre of gravity.   (08 Marks)
     b.   Locate the centroid of the section shown in Fig. Q5 (b).   (12 Marks)
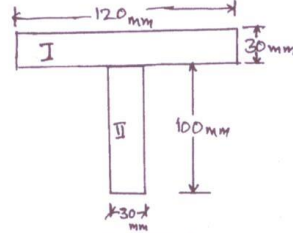
Fig. Q5 (b)

6   a.   Define radius of gyration and polar moment of inertia.   (04 Marks)
     b.   State the parallel axis theorem.   (04 Marks)
     c.   Find the centroid of the section shown in Fig. Q6 (c) where part II is hollow.   (12 Marks)
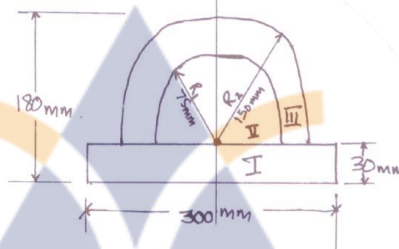
Fig. Q6 (c)

7   a.   Define perfect, deficient and redundant trusses with examples.   (08 Marks)
     b.   Explain the steps involved in the analysis of truss by method of joints.   (12 Marks)

8   Write short notes on the following:
     a.   Assumptions made in the analysis of trusses.   (05 Marks)
     b.   Free body diagram with two illustrations.   (05 Marks)
     c.   Analysis of frames by the method of sections.   (05 Marks)
     d.   State and prove verignon's theorem.   (05 Marks)

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